

## LISTING OF CLAIMS

1. (currently amended) A method for energy-saving operation of a dishwasher (110; 410), in particular for washing dishes (9; 414) or medical appliances, with the dishwasher (110; 410) having a total number  $N \geq 2$  of electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438), having the following steps:

a) a group of  $n$  electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) is assigned a maximum electrical total power  $p_{\max}$ ;

b) each electrical load element  $i$  in the group of  $n$  electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) is assigned a finite number  $m_i$  of discrete electrical power levels  $p_{ij}$  where  $m_i \geq 2$ :

- with there being a maximum power level  $p_{i\max}$  for each  $i$ , where  $p_{ij} \leq p_{i\max}$ ,
- where the sum of all maximum power levels  $p_{i\max}$  form a worst total power

$$P_{\text{worst}} = \sum_{i=1}^n p_{i\max} \quad \text{where } p_{\max} < p_{\text{worst}}, \text{ and}$$

- where a regular power level  $p_{i\text{reg}}$  exists for each  $i$ , where  $0 < p_{i\text{reg}} < p_{i\max}$  for all  $i, j$ ,

$$\text{and where } \sum_{i=1}^n p_{i\text{reg}} = p_{\max};$$

c) an optimum combination of power levels  $p_{ij}(B)$  is selected in a demand determination step, as a function of an operating state  $B$  of the dishwasher (110; 410),

- where the selected power level  $p_{ij}(B)$  for each  $i$  is matched to the power demand of the load element  $i$  (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) in the operating state  $B$ , and

- where:  $\sum_{i=1}^n p_{ij}(B) \leq p_{\max}$ , for all operating states  $B$ ; and

d) the electrical power of each load  $i$  in the group of  $n$  electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) is set to the power level  $p_{ij}(B)$ , with the maximum power level  $p_{i\max}$  being assigned, at least during one of the operating

states of the dishwasher (~~110; 410~~), to at least one load element (~~14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438~~) in the group of  $n$  electrical load elements (~~14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438~~); and  
in a load regulation phase, at least one load element  $r$ , where  $r \in \{1, \dots, n\}$  and which influences at least one operating state variable, which differs by more than a predetermined tolerance from a nominal value thereof, is operated at a power level which differs from its regular power level  $p_{reg}$ , until the at least one operating state variable once again assumes a value which differs by not more than the predetermined tolerance from its nominal value.

2. (currently amended) The method as claimed in ~~the preceding~~ claim 1, characterized in that a power level  $p_{ik}$  exists for each electrical load  $i$  (~~14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438~~), where  $0 < k \leq m_i$  and where  $p_{ik} = 0$ .
3. (previously presented) The method as claimed in claim 1, characterized in that  $m_i = 3$  for all  $i$ .
4. (currently amended) The method as claimed in claim 1, characterized in that the following method steps are additionally carried out:
  - e) the dishwasher (~~110; 410~~) is started, as a result of which a starting phase begins;
  - f) at least one temperature of at least one washing liquid, ~~in particular a temperature of water in at least one water tank (13, 17, 21; 416, 426) and/or water circuit,~~ is detected;
  - g) the at least one washing liquid is heated,
    - where at least one heating element (~~14, 18, 22, 26; 418, 432~~) which heats the washing liquid and forms the load element  $l$  where  $l \in \{1, \dots, n\}$  is operated at the maximum power level  $p_{lmax}$  associated with this heating element (~~14, 18, 22, 26; 418, 432~~), and
    - where at least one load element  $q$  (~~14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438~~) which is not the same as the heating element (~~14, 18, 22, 26; 418, 432~~) and where  $q \in \{1, \dots, n\}$  and  $q \neq l$  is operated at a lower power than the regular power level

$p_{qreg}$  associated with this load element  $q$  (~~14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438~~); and

h) as soon as the at least one temperature of the at least one washing liquid has reached or exceeded a predetermined nominal value, a switched-on phase is started,  
- where the power of all the load elements  $i$  (~~14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438~~) is set to the respectively associated regular power level  $p_{ireg}$ .

5. (currently amended) The method as claimed in ~~the preceding~~ claim 4, having the following additional ~~step~~ steps:

- i) at least one operating state variable is detected;
- j) at least one operating state variable is allocated a nominal value; and
- k) as soon as the value of the at least one operating state variable differs from the respectively associated nominal value by more than a predetermined tolerance, a load regulation phase is started.

6. (canceled)

7. (currently amended) The method as claimed in claim 1, characterized in that, in method step c), each load element (~~14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438~~) is allocated a priority, and in that the optimum combination of the power levels  $p_{ij}(B)$  is determined taking into account the priorities of the load elements (~~14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438~~).

8. (currently amended) The method as claimed in ~~the preceding~~ claim 7, characterized in that heating elements (~~14, 18, 22; 418, 432~~) which heat washing liquid, ~~in particular water in at least one water tank (13, 17, 21; 416, 426) and/or water circuit~~, is allocated a higher priority than other loads.

9. (currently amended) The method as claimed in claim 1, characterized in that all of the operating states  $B$  are characterized by an operating phase variable  $F$  and/or by a plurality of operating state variables,

- where the operating state variable F can assume at least three discrete values ( $F_1, F_2, F_3$ ),
- where  $F_1$  denotes a starting phase for operation of the dishwasher (110; 410),
- where  $F_2$  denotes a switched-on phase for operation of the dishwasher (110; 410), and
- where  $F_3$  denotes the load regulation phase for operation of the dishwasher (110; 410).

10. (currently amended) An apparatus for energy-saving operation of a dishwasher (110; 410), in particular for washing dishes (9; 414) or medical appliances, with the dishwasher (110; 410) having a total number  $N \geq 2$  of electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438), having:

- a) means (310) for assignment of a maximum electrical total power  $p_{\max}$  to a group of n electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438);
- b) means (310, 332, 334, 336, 338, 340; 452, 454, 456, 458) for assignment of a finite number  $m_i$  of discrete electrical power levels  $p_{ij}$  to each electrical load element i in the group of n electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438),

- with there being a maximum power level  $p_{i\max}$  for each i, where  $p_{ij} \leq p_{i\max}$ ,
- where the sum of all maximum power levels  $p_{i\max}$  form a worst total power

$$p_{\text{worst}} = \sum_{i=1}^n p_{i\max} \text{ where } p_{\max} < p_{\text{worst}}, \text{ and}$$

- where a regular power level  $p_{i\text{reg}}$  exists for each i, where  $0 < p_{i\text{reg}} < p_{i\max}$  for all i, j,

$$\text{and where } \sum_{i=1}^n p_{i\text{reg}} = p_{\max};$$

- c) means (310) for selection of an optimum combination of power levels  $p_{ij}(B)$ , as a function of an operating state B of the dishwasher (110; 410),

- where the selected power level  $p_{ij}(B)$  for each  $i$  is matched to the power demand of the load element  $i$  (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) in the operating state  $B$ , and

- where:  $\sum_{i=1}^n p_{ij}(B) \leq p_{\max}$ , for all operating states  $B$ ; ~~and~~

d) means (310, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340; 444, 446, 448, 450, 452, 454, 456, 458) for setting the electrical power of each load  $i$  (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) in the group of  $n$  electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) to the respective power level  $p_{ij}(B)$ , with the maximum power level  $p_{\max}$  being assigned, at least during one of the operating states of the dishwasher (110; 410), to at least one load element (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) in the group of  $n$  electrical load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438); and

means for operation of at least one load element  $r$ , where  $r \in \{1, \dots, n\}$  which influences at least one operating state variable, which differs by more than a predetermined tolerance from a nominal value thereof at a power level, which differs from its regular power level  $p_{\text{reg}}$ , in the load regulation phase, until the at least one operating state variable once again assumes a value which differs from its nominal value by not more than the predetermined tolerance.

11. (currently amended) The apparatus as claimed in ~~the preceding~~ claim 10, additionally having:

e) means (310) for starting the dishwasher (110; 410) by which means a starting phase is started;

f) means (318, 320) for detection of at least one temperature of at least one washing liquid, ~~in particular a temperature of water in at least one water tank (13, 17, 21; 416, 430) and/or water circuit;~~

g) at least one heating element (14, 18, 22, 26; 418, 432), which heats the at least one washing liquid and forms the load element  $l$  (14, 15, 18, 19, 22, 23, 26, 33; 418,

420, 432, 438) where  $l \in \{1, \dots, n\}$ , as well as means (322, 324, 326, 328; 448, 450) for operation of the at least one heating element (14, 18, 22, 26; 418, 432) at the maximum power level  $p_{lmax}$  associated with this heating element, as well as means (322, 324, 326, 328, 330; 444, 446, 448, 450) for operation of at least one load element  $q$  (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438), which is not the same as the at least one heating element, where  $q \in \{1, \dots, n\}$  and  $q \neq l$  at a lower power than the regular power level  $p_{qreg}$  associated with this load element  $q$  (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438); and

h) means (310) for starting a switched-on phase as soon as the at least one temperature of the at least one washing liquid has reached or exceeded a predetermined nominal value,

- where the power of all the load elements  $i$  (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) is set to the respectively associated regular power level  $p_{ireg}$ .

12. (currently amended) The apparatus as claimed in ~~the preceding claim~~ claim 11, additionally having:

- i) means (318) for detection of at least one operating state variable;
- l) means (310) for assignment of in each case one nominal value to at least one operating state variable; and
- m) means (310) for starting a load regulation phase as soon as the value of the at least one operating state variable differs by more than a predetermined tolerance from the respectively associated nominal value.

13. (canceled)

14. (currently amended) The apparatus as claimed in ~~claim 1~~ claim 10, characterized in that the means c) (310) for selection of an optimum combination of power levels  $p_{ij}(B)$  have means (310) for allocation of a priority to each load element (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) as a function of an operating state  $B$  of the dishwasher (110; 410), where the optimum

combination of the power levels  $p_{ij}$ (B) is determined taking into account the priorities of the load elements (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438).

15. (currently amended) The apparatus as claimed in ~~claim 1~~ claim 10, characterized in that the dishwasher is a multiple tank dishwasher (110).

16. (currently amended) The apparatus as claimed in ~~claim 1~~ claim 10, characterized in that the means b) (310, 332, 334, 336, 338, 340; 452, 454, 456, 458) for assignment of a finite number  $m_i$  of discrete electrical power levels  $p_{ij}$  to each electrical load element (14, 15, 18, 19, 22, 23, 26, 33; 418, 420, 432, 438) and/or the means c) (310) for selection of an optimum combination of power levels  $p_{ij}$ (B) as a function of an operating state B of the dishwasher (110; 410) have/has a look-up table (314) and/or an electronic table.

17. (currently amended) A computer program having computer-readable program code means in order to carry out a method as claimed in claim 1, when the computer program is run on a computer (310) or a computer network.

18. (currently amended) A computer program having program code ~~means~~ as claimed in ~~the~~ preceding claim 17, which program code ~~means are~~ is stored on a computer-legible data storage medium (314).

19. (new) A computer program stored on a computer-readable data storage medium, the program, when executed, causing a computer to carry out the method recited in claim 4.